

Bradley's maternal uncle. The reputation of Pound has been overshadowed by that of his more brilliant, but perhaps less versatile, nephew, and it is most desirable to give the uncle his proper position. The whole chapter constitutes a most delightful piece of biography.

The accidental discovery of a "new star" does not differ materially from that of a planet, and the author admits that this fourth chapter might very well have been the first of the series, but we agree with him that it is not a matter upon which to lay any particular stress. The particular discovery is only a peg on which to hang the remarks that the author wishes to make on certain subjects. In this case the discovery of the "new star" in Gemini, at Oxford, by means of photography, serves to introduce an account of the International Chart of the Heavens, and some remarks connected with the behaviour of Nova Persei. This chapter presents a careful examination of the facts and suggestions that have been brought to light by observation. The history of Schwabe and his work on sun-spots do not call for any particular remark. The chapter is not long, and it covers the ground very satisfactorily. In the last lecture, Prof. Turner gives an account of the variation of latitude, wherein he is seen quite at his best. The subject is not so hackneyed as some of the other selections, but to speak to Americans of the work accomplished by Mr. Chandler was, no doubt, inspiring, and the successive steps by which Mr. Chandler established his case are described with clear, logical sequence. Usually the author ends his lecture by pointing out what particular lessons are to be drawn from the discovery under examination, and they generally amount to this, that there is no line of research, however apparently unimportant or monotonous, which can be safely neglected. Some inquiries seem to offer a more immediate prospect of success, such as the establishment of observatories in the Southern Hemisphere, to make accurate observations on the motion of the Pole; but at the same time unexpected discoveries may lie in a direction precisely opposite to that indicated by the most educated opinion at present available. The conclusion may be obvious, but the remark is not unnecessary. To be led too strictly by authority is unwise, to neglect the teachings of experience is a crime.

W. E. P.

ZOOLOGICAL RESULTS.

Zoological Results based on Material from New Britain, New Guinea, Loyalty Islands and Elsewhere, collected during the Years 1895, 1896, and 1897, by Arthur Willey, D.Sc.Lond. Parts i.-vi. Pp. vi+830; illustrated. (Cambridge: University Press.)

THIS splendid series of "zoological results" should have been recognised at an earlier date in our columns, but the six volumes have appeared through a lustrum of five years, and the fine series of memoirs has mounted up to a total which baffles reviewing. As Balfour student of the University of Cambridge, Arthur Willey went in 1894 to the Pacific

in search of the eggs of the pearly nautilus. He found these, but so much more of great interest, e.g. as to *Peripatus*, *Amphioxus*, *Balanoglossus*, *Ctenoplanea*, that his tenure of the Balfour scholarship was on two successive occasions judiciously extended for a year beyond the allotted triennium. In his arduous but well rewarded explorations, Dr. Willey was aided by the Government Grant Committee of the Royal Society, who may congratulate themselves on the fact that the money at their disposal was never better spent than on this enterprise. It has seldom been the happy fortune of a single zoologist to bring together in a short span such rich material, including some of the most interesting zoological types.

In part i. Dr. Willey describes the structure and development of *Peripatus novae-britanniae*, n.sp., and in so doing throws some fresh light on the heterogeneity of the class Onychophora, which this "delightful creature" represents. Dr. Paul Mayer describes a new caprellid; Mr. G. A. Boulenger discusses a very rare sea-snake (*Aipysurus annalatus*) from the South Pacific; Mr. R. I. Pocock reports on the centipedes, millipedes, scorpions, Pedipalpi, and spiders; and Dr. Sharp gives an account of the phasmids, with notes on their remarkable eggs.

In part ii. Prof. Hickson reports on Millepora, showing that the single species (*M. alcicornis*) illustrates that great variability in the form of growth which is a characteristic feature of the genus. Prof. Jeffrey Bell discusses the echinoderms (other than holothurians, which are dealt with separately by Mr. F. P. Bedford). Mr. Arthur E. Shipley reports on the sipunculoids, Mr. J. Stanley Gardiner on the solitary corals and on the post-embryonic development of Cycloseris, Mr. Beddard on the earthworms, and Miss Isa L. Hiles on the Gorgonacea, which includes some interesting new species.

In part iii. Dr. Gadow has an interesting essay on orthogenetic variation in the shells of Chelonia, that is to say, cases in which the variations from the normal type seem to lie in the direct line of descent; Dr. Willey describes three new species of Enteropneusta, and develops several theories, e.g. that the gill-slits arose originally as perforations in the inter-annular grooves for the aëration of the gonads which occupied the dividing ranges; and Mr. A. E. Shipley reports on the echiurids, making a welcome attempt to revise the group and to determine its geographical range.

In part iv. Mr. Stanley Gardiner describes the structure of a supposed new species of Cœnopsammia from Lifu, and comes *inter alia* to the striking conclusion that the so-called endoderm in Anthozoa, giving rise to the muscular bands and generative organs, and performing also the excretory functions, is homologous with the mesoderm of Triploblastica. In terms of the layer theory, of whatever value it may be, the actinozoan polyp must be regarded as a triploblastic form. Dr. Sharp reports on insects from New Britain, Mr. L. A. Borradaile on Stomatopoda and Macrura from the South Seas, Mr. Walter E. Collinge on the slugs, Mr. E. G. Philipps on the Polyzoa, Miss Laura Roscoe Thornely on the hydroid zoophytes, and Mr. J. J. Lister describes a remarkable type of a new family

of sponges (*Astroclera willeyana*), a very interesting novelty. Mr. W. P. Pycraft discusses the pterylography of the Megapodii, Prof. Hickson and Miss Isa L. Hiles the Stolonifera and Alcyonacea, and Dr. Ashworth the Xeniidæ.

In part v. Mr. Arthur E. Shipley gives a description of the Entozoa which Dr. Willey collected during his sojourn in the western Pacific, including *Parocephalus tortus*, Shipley, a member of the interesting family Linguatulidæ. Mr. R. C. Punnett discusses some South Pacific nemertines, Mr. L. A. Borradaile has an interesting note on the young of the robber crab, Miss Edith M. Pratt describes the structure of *Neohelia porcellana*, Mr. Boulenger reports on a new blind snake from Lifu, and the Rev. T. R. R. Stebbing deals with the Crustacea.

Part vi. contains Dr. Willey's contributions to the natural history of the pearly nautilus—a fine piece of work—and his personal narrative, which is not less creditable. In his narrative, amid interesting details of how he went about his collecting business, he discusses, as a zoologist, his new Peripatus, the Ascidian *Styeloides eviscerans*, which readily throws out its entrails in holothurian fashion, the interesting intermediate type Ctenoplana, "which no zoologist could encounter without experiencing a momentary thrill of satisfaction," the lancelets and enteropneusts which he observed, some of the remarkable new forms which he discovered, such as *Astroclera*, and the egg-laying of nautilus—his main quest. The whole story reflects great credit on the indefatigable explorer himself and on those who have assisted him in working up the descriptions which form this imposing six-volume series of zoological results.

OUR BOOK SHELF.

Flora of the County Dublin. By Nathaniel Colgan. Pp. lxx+324. (Dublin: Hodges, Figgis and Co., Ltd., 1904.)

In many respects this district is an interesting one, and the floral distribution not quite what might have been expected from a consideration of the adjacent counties. The flora resembles that of southern rather than northern Britain, but the somewhat unexpected result is arrived at that the western Irish flora has a considerably larger proportion of northern plants than has the corresponding eastern flora. The book opens with a summary of previous work in the district from the fifteenth century to the present day. The physical features are then described, and a section headed "Relations of Plants and Soils" lays particular emphasis on the distinction between "calcifuges" and "calcicoles."

Some plants curiously absent from the county are mentioned, one of which, *Nymphaea alba*, L., occurs in Meath, Kildare, and Wicklow. Both *Trifolium repens*, L., and *T. dubium*, Sibth., are stated to do duty as the shamrock or shamrogue. Probably *Oxalis acetosella*, L., has never served as the Irish national badge, this erroneous impression apparently dating from a paper by J. E. Bicheno published in 1830. Mr. Colgan cannot add *Epilobium tetragonum*, L., to the Irish list, although *E. obscurum*, Schreber, is common in the upland districts. A description of that interesting hybrid *Senecio Cineraria*, D.C., \times *S. Jacobaea*, L.,

is given. The belief that one of its forms is identical with the Italian *S. Calvescens* must be abandoned if Sig. Sommier's conclusion that this last plant is *S. Cineraria* \times *S. erraticus*, Bertolini, be accepted. It is decidedly suggestive to find that our common *S. Jacobaea* hybridises so much more readily with an alien species than with its fellow Senecios of the British Isles. Another curious fact concerning hybrids deserves mention. The common cross *Primula veris* \times *vulgaris*, as found in Kenmure Park and in several other localities, approaches very nearly to the primrose, while the Ballinoscorney plant closely resembles the cowslip. This curious state of affairs demands experimental investigation. Space limitations forbid mention of any more of the numerous points of general botanical interest contained in the volume.

The author is to be congratulated on having produced something far more useful than the mere catalogue of names and places sometimes dignified by the title "County Flora." Particularly pleasing is the attention paid to local names, given in the Irish-Gaelic characters. It is rather surprising that philologists do not devote more study to local and often rapidly disappearing dialects. The botanist working a country district is exceptionally well placed for collecting information on such subjects, and might with advantage make use of his opportunities.

Exercises in Practical Physiological Chemistry. By Sydney W. Cole, M.A. Pp. vii+152. (Cambridge: W. Heffer and Sons; London: Simpkin, Marshall and Co., Ltd., 1904.) Price 5s. net.

Practical Exercises in Chemical Physiology and Histology. By H. B. Lacey and C. A. Pannett, B.Sc. Pp. 112. (Cambridge: W. Heffer and Sons; London: Simpkin, Marshall and Co., Ltd., 1904.) Price 2s. net.

NOTHING more forcibly illustrates the growing importance attached to the chemical side of physiology than the institution of practical courses dealing with this branch of the subject in centres of physiological teaching. Accompanying this is a multiplication of practical guides. Every teacher has his idiosyncrasies in the exercises he selects for his classes, but one is inclined to doubt whether these are always sufficiently pronounced or important to justify him in issuing a fresh handbook. Competition, however, is not to be despised, and will in the end lead to the survival of the fittest. In the struggle, Mr. Cole's little book, which represents the Cambridge course, will doubtless maintain its own. Though short it is admirably clear, and the practical exercises are judiciously selected. The author is well known for his researches in physiological chemistry, and possesses that preliminary knowledge of pure chemistry which is so necessary nowadays for a successful pursuit of its physiological application.

The book is free from illustrations; the student is required to make his own drawings of crystals, absorption spectra, and so forth in the blanks left for the purpose. This is an admirable idea, and one hopes that the zealous and interested care that Mr. Cole asks from the students in his preface will be responded to in the manner he desires.

The book does not pretend to be complete, but as an elementary introduction to more advanced work it is excellent. I do not propose to direct attention to faults of omission, for these are obviously intentional; the only fault of commission I have discovered is on p. 78, where the statement made implies that potassium ferricyanide contains oxygen.

The second book, that by Messrs. Lacey and